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REMARKS

Claims 1-8 and 12-24 and 26-30 remain in the application. By this amendment claims 1 and 14 have been amended, and claims 9, 11 and 25 have been cancelled. (Claim 10 was previously canceled.) The present application as originally filed supports this amendment. No new matter has been added.

Claim Rejections Based on Moldenhauser in View of Kuhn et al.

Claims 1-4, 6-8, 12, 13, 22, 23 and 26-29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,394,257 to Moldenhauser in view of U.S. Patent No. 1,572,395 to Kuhn et al. Applicant respectfully traverses this rejection since neither Moldenhauser nor Kuhn et al. disclose or suggest a helically wound filament having a diameter that monotonically decreases.

Independent claim 1, from which claims 2-4, 6-8, 12, 13, 22, 23 and 26-29 depend, has been currently amended to more clearly define the present invention. Claim 1 recites a radiation source including, in combination, a base, a curved reflector, at least two pins passing through the base, within the reflector, and along an axis of the reflector, and a filament helically wound about the pins and having a high emissivity outwardly facing surface and opposing ends electrically connected to a respective one of the pins so that upon passage of electrical energy through the filament, the filament becomes electrically heated and emits infrared radiation. In addition, the helically wound filament has a diameter that monotonically decreases along the axis and away from the base.

Monotonic is defined as designating sequences, the successive members of which either consistently increase or decrease but do not oscillate in relative value. Each member of a monotone increasing sequence is greater than or equal to the preceding member; each member of

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a monotone decreasing sequence is less than or equal to the preceding member. *The American Heritage® Dictionary of the English Language, Fourth Edition Copyright © 2000 by Houghton Mifflin Company.*

Applicant respectfully submits that neither Moldenhauser nor Kuhn et al., whether considered alone or in combination, disclose or suggest the invention as recited in claims 1-4, 6-8, 12, 13, 22, 23 and 26-29.

Moldenhauser Does Not Disclose or Suggest the Invention as Recited in Claims
1-4, 6-8, 12, 13, 22, 23 and 26-29

Moldenhauser does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead Moldenhauser discloses an infrared radiator 1 including a reflective cavity 2 in the shape of a parabola. Leads 6 extend through a ceramic bushing 7 and support a helical coil emitter 11. The helical coil emitter 11 of Moldenhauser does not have a diameter that monotonically decreases along an axis and away from the ceramic bushing 7. Moldenhauser, therefore, does not anticipate or make obvious a radiation source, as recited in claims 1-4, 6-8, 12, 13, 22, 23 and 26-29 of the present application.

Kuhn et al. Also Does Not Disclose or Suggest the Invention as Recited in Claims
1-4, 6-8, 12, 13, 22, 23 and 26-29

Kuhn et al. does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead Kuhn et al. discloses a heating unit having an elliptical reflector 9 and a coiled heating element 2. The coiled heating element 2 is gradually reduced in diameter from an intermediate point to its respective extremities (also referred in Kuhn et al. to as “double taper”).

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Because of the double taper, the end portions of the coiled heating element 2 do not interfere with the direct forward or rearward radiation from the intermediate point of the coiled heating element 2 (see column 2, lines 54-61 of Kuhn et al.). The coiled heating element 2 of Kuhn et al. does not have a diameter that monotonically decreases along an axis and away from a base of the source. Kuhn et al., therefore, does not anticipate or make obvious a radiation source, as recited in claims 1-4, 6-8, 12, 13, 22, 23 and 26-29 of the present application and, in fact, teaches away from a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source.

The Combination of Moldenhauser and Kuhn et al. Does Not Disclose or Suggest the Invention as Recited in Claims 1-4, 6-8, 12, 13, 22, 23 and 26-29

The combination of Moldenhauser and Kuhn et al. also does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead, the combination of Moldenhauser and Kuhn et al. produces, for example, an infrared radiator including a reflective cavity in the shape of a parabola, with leads extending through a ceramic bushing and supporting a coiled heating element having a diameter that increases and then decreases along an axis and away from a base of the ceramic bushing.

Applicant respectfully submits that independent claim 1 as currently amended is not anticipated or made obvious by Moldenhauser or Kuhn et al., whether these references are considered alone or in combination, and requests reconsideration and withdrawal of the rejection of claims 1-4, 6-8, 12, 13, 22, 23 and 26-29 under 35 U.S.C. 103(a) as being unpatentable over Moldenhauser in view of Kuhn et al.

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Claim Rejections Based on Moldenhauser in View of Kuhn et al. and Further in View of Boland et al. and George et al.

Claims 5 and 14-21 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Moldenhauser in view of Kuhn et al. and further in view of U.S. Patent No. 5,438,233 to Boland et al. and U.S. Patent Application Publication No. 2002/0096492 to George et al. The patent office submits that the combination of Moldenhauser and Kuhn et al. disclose all elements of claims 5 and 14-21, except for window material, filament texture features, and emissions cut-off, but that Boland et al. and George et al. disclose these additional elements. Applicant respectfully traverses this rejection even assuming arguendo that Boland et al. and George et al. disclose window material, filament texture features, and emissions cut-off.

Neither Moldenhauser nor Kuhn et al., Whether Considered Alone or In Combination Disclose or Suggest the Invention as Recited in Claims 5 and 14-21

Claims 5 and 14-21 depend from claim 1. As discussed above, independent claim 1 is not anticipated or made obvious by Moldenhauser or Kuhn et al., whether these references are considered alone or in combination, since neither Moldenhauser or Kuhn et al. discloses a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Since claims 5 and 14-21 depend from claim 1, these are also not anticipated or made obvious by Moldenhauser and/or Kuhn et al.

Boland et al. Does Not Disclose or Suggest the Invention as Recited in Claims 5 and 14-21

Boland et al. does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead Boland et al. discloses a lamp configuration for infrared radiation

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incorporating optical elements including spectral filters and lenses. The lamp configuration includes a filament broad band IR source 11, which may be a helix 11a or loop 11b. Boland et al., therefore, does not anticipate or make obvious a radiation source, as recited in claims 5 and 14-21 of the present application.

George et al. Also Does Not Disclose or Suggest the Invention as Recited in Claims 5 and 14-21

George et al. also does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead George et al. discloses a micromachined tuned-band hot bolometer emitter that does not even have a helically wound filament. George et al., therefore, does not anticipate or make obvious a radiation source, as recited in claims 5 and 14-21 of the present application.

The Combination of Moldenhauser, Kuhn et al., Boland et al. and George et al. Does Not Disclose or Suggest the Invention as Recited in Claims 5 and 14-21

The combination of Moldenhauser, Kuhn et al., Boland et al. and George et al. also does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead, the combination of Moldenhauser, Kuhn et al., Boland et al. and George et al. produces, for example, an infrared radiator including a reflective cavity in the shape of a parabola, with leads extending through a ceramic bushing and supporting a coiled heating element having a diameter that increases and then decreases along an axis and away from a base of the ceramic bushing, and wherein the infrared radiator has window material, filament texture features, and emissions cut-off as disclosed in Boland et al. and George et al.

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Applicant therefore respectfully submits that independent claims 5 and 14-21 are not anticipated or made obvious by Moldenhauser, Kuhn et al., Boland et al. or George et al., whether these references are considered alone or in combination. Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 5 and 14-21 under 35 U.S.C. 103(a) over Moldenhauser in view of Kuhn et al. and further in view of Boland et al. and George et al.

Claim Rejections Based on Moldenhauser in View of Kuhn et al. and Further in View of Karlsson

Claims 24 and 30 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Moldenhauser in view of Kuhn et al., and further in view of U.S. Patent No. 6,034,360 to Karlsson. The patent office submits that the combination of Moldenhauser and Kuhn et al. teaches all of the elements of claims 24 and 30 except for the filament and pin materials, but that Karlsson discloses these additional elements. Applicant respectfully traverses this rejection even assuming arguendo that Karlsson discloses the filament and pin materials.

Neither Moldenhauser nor Kuhn et al., Whether Considered Alone or In Combination Disclose or Suggest the Invention as Recited in Claims 24 and 30

Claims 24 and 30 depend from claim 1. As discussed above, independent claim 1 is not anticipated or made obvious by Moldenhauser or Kuhn et al., whether these references are considered alone or in combination, since neither Moldenhauser or Kuhn et al. discloses a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Since claims 24 and 30 depend from claim 1, these are also not anticipated or made obvious by Moldenhauser and/or Kuhn et al.

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Karlsson Does Not Disclose or Suggest the Invention as Recited in Claims 24 and 30

Karlsson does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead Karlsson discloses an infrared radiator having a filament coil 1 having a constant diameter. Karlsson, therefore, does not anticipate or make obvious a radiation source, as recited in claims 24 and 30 of the present application.

The Combination of Moldenhauser, Kuhn et al. and Karlsson Does Not Disclose or Suggest the Invention as Recited in Claims 24 and 30

The combination of Moldenhauser, Kuhn et al. and Karlsson also does not disclose or suggest a radiation source including a helically wound filament having a diameter that monotonically decreases along an axis and away from a base of the source. Instead, the combination of Moldenhauser, Kuhn et al. and Karlsson produces, for example, an infrared radiator including a reflective cavity in the shape of a parabola, with leads extending through a ceramic bushing and supporting a coiled heating element having a diameter that increases and then decreases along an axis and away from a base of the ceramic bushing, and wherein the infrared radiator has the filament and pin materials as disclosed in Karlsson.

Applicant therefore respectfully submits that independent claims 24 and 30 are not anticipated or made obvious by Moldenhauser, Kuhn et al. and Karlsson, whether these references are considered alone or in combination. Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 24 and 30 under 35 U.S.C. 103(a) over Moldenhauser in view of Kuhn et al. and further in view of Karlsson.

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Conclusion

In view of the amendments and remarks submitted herein, applicant believes that all claims pending in the application are in condition for allowance and respectfully request such allowance. If a telephone conference will expedite prosecution of the application the Examiner is invited to telephone the undersigned.

No fee is believed to be required; however, if a fee is required, or otherwise necessary to cover any deficiency in fees already paid, authorization is hereby given to charge our deposit account no. 50-1133.

Respectfully submitted,

McDermott, Will & Emery

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